

U.S. ATLAS M&O Estimate

WBS Profile Estimates

Funding Source: All

Funding Type: Research Program

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Institutions: All

Estimate in Fixed FY'04 \$k

Labor/Material: Both

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3	U.S. ATLAS M&O Estimate	0	4226	7654	9833	9455	9048	8729	8817	8914	8379
3.1	Silicon	0	147	547	1094	1235	1213	965	1020	1098	781
3.1.1	Pixels	0	0	0	550	515	485	345	342	342	342
3.1.1.1	Pre-operations	0	0	0	550	149	0	0	0	0	0
3.1.1.1.1	SR Building Facilities	0	0	0	0	0	0	0	0	0	0
3.1.1.1.2	Mechanical support	0	0	0	191	0	0	0	0	0	0
3.1.1.1.3	Electrical support	0	0	0	189	65	0	0	0	0	0
3.1.1.1.4	Software support	0	0	0	169	85	0	0	0	0	0
3.1.1.1.5	Physicist support	0	0	0	0	0	0	0	0	0	0
3.1.1.2	Operations	0	0	0	0	347	438	316	316	316	316
3.1.1.2.1	Mechanical Support	0	0	0	0	147	162	96	96	96	96
3.1.1.2.2	Electrical Support	0	0	0	0	110	105	49	49	49	49
3.1.1.2.3	Software support	0	0	0	0	90	171	171	171	171	171
3.1.1.2.4	Physicist support	0	0	0	0	0	0	0	0	0	0
3.1.1.3	Maintenance	0	0	0	0	19	47	28	26	26	26
3.1.1.3.1	Mechanical support	0	0	0	0	19	19	0	0	0	0
3.1.1.3.2	Electrical support	0	0	0	0	0	28	28	26	26	26
3.1.1.3.3	Software support	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.1.1.3.4	Physicist support	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5	Spares	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.1	Mechanics/Services	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.2	Sensors	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.3	Electronics	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.4	Hybrids	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.5	Modules	0	0	0	0	0	0	0	0	0	0
3.1.2	SCT	0	42	239	154	222	115	115	115	309	115
3.1.2.1	Pre-operations	0	0	183	154	0	0	0	0	0	0
3.1.2.1.1	Preoperations - LBNL	0	0	0	0	0	0	0	0	0	0
3.1.2.1.2	Preoperations - UCSC	0	0	183	154	0	0	0	0	0	0
3.1.2.1.3	Preoperations - SR	0	0	0	0	0	0	0	0	0	0
3.1.2.2	Operations	0	0	0	0	108	105	105	105	105	105
3.1.2.2.1	LBNL	0	0	0	0	0	0	0	0	0	0
3.1.2.2.2	UCSC	0	0	0	0	108	105	105	105	105	105
3.1.2.2.3	SR building/CERN	0	0	0	0	0	0	0	0	0	0
3.1.2.3	Maintenance	0	42	56	0	114	10	10	10	205	10
3.1.2.3.1	Spares	0	42	56	0	0	0	0	0	0	0
3.1.2.3.1.2	Hybrid Assembly/Test	0	0	20	0	0	0	0	0	0	0
3.1.2.3.1.2.1	Hybrid Assembly/Test -LBNL	0	0	12	0	0	0	0	0	0	0
3.1.2.3.1.2.2	Hybrid Assembly/Test - UCSC	0	0	8	0	0	0	0	0	0	0
3.1.2.3.1.3	Module Assembly/Test	0	42	36	0	0	0	0	0	0	0
3.1.2.3.1.3.1	Module Assembly/Test - LBNL	0	42	33	0	0	0	0	0	0	0
3.1.2.3.1.3.2	Module Assembly/Test - UCSC	0	0	3	0	0	0	0	0	0	0

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3.1.2.3.2	Manpower/materials	0	0	0	0	114	10	10	10	205	10
3.1.3	RODs	0	0	226	235	268	157	85	85	85	85
3.1.3.1	Pre-operations	0	0	226	235	0	0	0	0	0	0
3.1.3.1.1	Wisconsin	0	0	182	192	0	0	0	0	0	0
3.1.3.1.2	LBNL	0	0	44	44	0	0	0	0	0	0
3.1.3.1.3	Iowa State	0	0	0	0	0	0	0	0	0	0
3.1.3.2	Operations	0	0	0	0	226	114	43	43	43	43
3.1.3.2.1	Wisconsin	0	0	0	0	182	95	23	23	23	23
3.1.3.2.2	LBNL	0	0	0	0	44	20	20	20	20	20
3.1.3.2.3	Iowa State	0	0	0	0	0	0	0	0	0	0
3.1.3.3	Maintenance	0	0	0	0	42	42	42	42	42	42
3.1.3.3.1	Spares	0	0	0	0	0	0	0	0	0	0
3.1.3.3.2	Personnel/materials	0	0	0	0	42	42	42	42	42	42
3.1.4	Common Silicon/ID	0	106	82	154	229	456	421	478	362	239
3.1.4.1	Pre-operations	0	0	0	0	0	0	0	0	0	0
3.1.4.2	Maintenance Operations	0	106	82	154	229	456	421	478	362	239
3.2	TRT	0	287	567	464	349	416	398	427	369	307
3.2.1	TRT-Subsystem	0	234	526	387	235	188	188	188	188	188
3.2.1.1	TRT Pre-operations	0	234	496	327	58	0	0	0	0	0
3.2.1.1.1	Module Check(7/02-12/04	0	10	1	0	0	0	0	0	0	0
3.2.1.1.1.1	Technical support (Duke)	0	6	0	0	0	0	0	0	0	0
3.2.1.1.1.2	equipment	0	4	1	0	0	0	0	0	0	0
3.2.1.1.1.2.1	gas leak tester	0	0	0	0	0	0	0	0	0	0

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3.2.1.1.1.2.2	multi channel tension	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.3	HV breakdown test	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.4	gain mapper	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.5	HV training supplies, cables	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.6	storage and support	0	4	1	0	0	0	0	0	0	0
3.2.1.1.1.3	other technical support (russian)	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4	TRT-6 mod-check (2/04- 1/05)	0	224	163	0	0	0	0	0	0	0
3.2.1.1.4.1	technical support (Kline)	0	82	31	0	0	0	0	0	0	0
3.2.1.1.4.2	other technical support	0	0	31	0	0	0	0	0	0	0
3.2.1.1.4.3	project engineer(Callahan)	0	0	48	0	0	0	0	0	0	0
3.2.1.1.4.4	electronics technician(C.	0	53	53	0	0	0	0	0	0	0
3.2.1.1.4.5	Electronics tech- Yale	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4.9	HV distribution	0	40	0	0	0	0	0	0	0	0
3.2.1.1.4.10	Low Voltage system	0	35	0	0	0	0	0	0	0	0
3.2.1.1.4.11	system tests	0	15	0	0	0	0	0	0	0	0
3.2.1.1.5	TRT- SCT in SR (1/05 - 9/05)	0	0	332	0	0	0	0	0	0	0
3.2.1.1.5.1	technical	0	0	0	0	0	0	0	0	0	0
3.2.1.1.5.2	Project Engineer(Callahan)	0	0	48	0	0	0	0	0	0	0
3.2.1.1.5.3	Technical support (Kline)	0	0	55	0	0	0	0	0	0	0
3.2.1.1.5.4	Electrical Engineer(VanBerg)	0	0	90	0	0	0	0	0	0	0
3.2.1.1.5.5	system test	0	0	7	0	0	0	0	0	0	0
3.2.1.1.5.6	testing equipment	0	0	40	0	0	0	0	0	0	0
3.2.1.1.5.7	electronics tech(C. Alexander)	0	0	61	0	0	0	0	0	0	0
3.2.1.1.5.8	Technical support (Russian)	0	0	31	0	0	0	0	0	0	0
3.2.1.1.8	ID Integration(10/05-4/07)	0	0	0	327	58	0	0	0	0	0
3.2.1.1.8.1	Technical support (Duke)	0	0	0	0	0	0	0	0	0	0
3.2.1.1.8.2	Computer professional	0	0	0	79	32	0	0	0	0	0
3.2.1.1.8.3	electronics tech	0	0	0	57	26	0	0	0	0	0
3.2.1.1.8.4	electrical Engineer	0	0	0	90	0	0	0	0	0	0

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3.2.1.1.8.5	testing equipment	0	0	0	24	0	0	0	0	0	0
3.2.1.1.8.6	beamtest and system tests	0	0	0	15	0	0	0	0	0	0
3.2.1.1.8.7	technical support (Russian)	0	0	0	63	0	0	0	0	0	0
3.2.1.2	Operations	0	0	0	0	76	76	76	76	76	76
3.2.1.2.1	Runtime activities	0	0	0	0	76	76	76	76	76	76
3.2.1.2.1.1	technical support (Russian)	0	0	0	0	31	31	31	31	31	31
3.2.1.2.1.3	computer professional	0	0	0	0	12	12	12	12	12	12
3.2.1.2.1.4	electronics technician	0	0	0	0	33	33	33	33	33	33
3.2.1.2.1.6	Testing equipment	0	0	0	0	0	0	0	0	0	0
3.2.1.3	TRT Maintenance	0	0	30	60	100	111	111	111	111	111
3.2.1.3.1	Shutdown maintenance	0	0	0	40	100	111	111	111	111	111
3.2.1.3.1.1	technical support (Russian)	0	0	0	0	31	31	31	31	31	31
3.2.1.3.1.3	Computer Professional	0	0	0	0	12	31	31	31	31	31
3.2.1.3.1.4	electronics technician	0	0	0	0	33	33	33	33	33	33
3.2.1.3.1.6	Testing equipment	0	0	0	16	16	16	16	16	16	16
3.2.1.3.1.7	Maintenance equipment	0	0	0	24	8	0	0	0	0	0
3.2.1.3.2	spares	0	0	30	20	0	0	0	0	0	0
3.2.1.3.2.4	circuit board spares	0	0	30	20	0	0	0	0	0	0
3.2.2	Common TRT/ID	0	53	41	77	115	228	211	239	181	120
3.2.2.1	Pre-Operations	0	0	0	0	0	0	0	0	0	0
3.2.2.2	Maintenance and operations (IU)	0	0	41	77	115	228	211	239	181	120
3.2.2.3	Maintenance and operations	0	53	0	0	0	0	0	0	0	0
3.3	Liquid Argon M&O Estimate	0	1310	1609	1917	1764	1880	1856	1806	1814	1726
3.3.1	Mechanical Liquid Argon M&O	0	139	303	510	505	556	458	465	482	458
3.3.1.1	Pre-operations and	0	124	251	86	0	0	0	0	0	0

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3.3.1.1.1	Cryostat	0	16	49	38	0	0	0	0	0	0
3.3.1.1.1.1	Cryostat documentation update	0	16	49	38	0	0	0	0	0	0
3.3.1.1.2	Feedthrough	0	40	40	11	0	0	0	0	0	0
3.3.1.1.2.1	Signal Feedthrough	0	19	19	5	0	0	0	0	0	0
3.3.1.1.2.2	HV Feedthrough Documentation	0	21	21	6	0	0	0	0	0	0
3.3.1.1.2.2.1	HV Feedthrough Documentation	0	0	0	6	0	0	0	0	0	0
3.3.1.1.2.2.2	HV Feedthrough Documentation	0	21	21	0	0	0	0	0	0	0
3.3.1.1.3	Cryogenics	0	68	159	36	0	0	0	0	0	0
3.3.1.1.3.1	Cryogenics documentation	0	0	3	36	0	0	0	0	0	0
3.3.1.1.3.2	Cryogenics Commissioning	0	68	137	0	0	0	0	0	0	0
3.3.1.1.3.3	HV Feedthrough Commissioning	0	0	19	0	0	0	0	0	0	0
3.3.1.1.4	Forward Calorimeter	0	0	3	0	0	0	0	0	0	0
3.3.1.1.4.1	FCAL Documentation update	0	0	3	0	0	0	0	0	0	0
3.3.1.2	Operations	0	7	19	231	331	295	221	229	221	221
3.3.1.2.1	Cryostat	0	0	0	41	41	41	41	41	41	41
3.3.1.2.1.1	Cryostat operations	0	0	0	41	41	41	41	41	41	41
3.3.1.2.2	Feedthrough	0	0	19	9	82	82	82	89	82	82
3.3.1.2.2.1	Signal Feedthroughs operations	0	0	5	9	62	62	62	62	62	62
3.3.1.2.2.2	HV Feedthroughs operations	0	0	14	0	20	20	20	28	20	20
3.3.1.2.3	Cryogenics	0	7	0	108	135	99	69	69	69	69
3.3.1.2.3.1	Quality Meter	0	0	0	0	51	51	20	20	20	20
3.3.1.2.3.2	Cryogenics operations	0	7	0	108	84	49	49	49	49	49
3.3.1.2.4	FCAL	0	0	0	73	73	73	30	30	30	30

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3.3.1.2.4.1	FCAL operations	0	0	0	73	73	73	30	30	30	30
3.3.1.3	Maintenance	0	8	33	194	175	261	237	237	261	237
3.3.1.3.1	Cryostat-Maintenance of	0	0	0	0	16	36	36	36	36	36
3.3.1.3.1.1	Maintenance of the mechanical	0	0	0	0	16	36	36	36	36	36
3.3.1.3.2	Feedthrough	0	8	0	48	12	78	53	53	78	53
3.3.1.3.2.1	Signal Feedthrough Maintenance	0	0	0	24	6	23	23	23	23	23
3.3.1.3.2.2	HV Feedthrough Maintenance	0	8	0	24	6	54	30	30	54	30
3.3.1.3.3	Cryogenics	0	0	33	122	122	124	124	124	124	124
3.3.1.3.3.1	Quality Meters	0	0	33	52	52	53	53	53	53	53
3.3.1.3.3.2	Cryogenics Maintenance	0	0	0	70	70	70	70	70	70	70
3.3.1.3.4	FCAL	0	0	0	24	24	24	24	24	24	24
3.3.1.3.4.1	FCAL	0	0	0	24	24	24	24	24	24	24
3.3.2	Electronic Liquid Argon M&O	0	699	1063	1210	965	919	978	924	915	915
3.3.2.1	Pre operations and	0	540	609	404	34	0	0	0	0	0
3.3.2.1.3	System Crate Integration	0	239	412	238	34	0	0	0	0	0
3.3.2.1.3.1	Crate Documentation update	0	0	78	0	0	0	0	0	0	0
3.3.2.1.3.2	System Electronic Integration	0	115	0	0	0	0	0	0	0	0
3.3.2.1.3.3	Facilities	0	0	15	15	15	0	0	0	0	0
3.3.2.1.3.4	Systems Crate Pre-operations	0	0	129	89	0	0	0	0	0	0
3.3.2.1.3.5	System Crate pre-operations -	0	28	146	90	0	0	0	0	0	0
3.3.2.1.3.6	System Crate - Crate Burn In	0	97	44	44	19	0	0	0	0	0
3.3.2.1.4	Front End Board	0	0	47	0	0	0	0	0	0	0
3.3.2.1.4.1	Front End Board Documentation	0	0	47	0	0	0	0	0	0	0
3.3.2.1.5	Level 1 Trigger	0	301	114	114	0	0	0	0	0	0

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3.3.2.1.5.1	Level 1 Trigger documentation	0	63	0	0	0	0	0	0	0	0
3.3.2.1.5.2	System Crate pre-operations	0	130	86	86	0	0	0	0	0	0
3.3.2.1.5.3	FEB documentation update	0	109	28	28	0	0	0	0	0	0
3.3.2.1.6	ROD System	0	0	37	53	0	0	0	0	0	0
3.3.2.1.6.1	ROD Documentation update	0	0	2	20	0	0	0	0	0	0
3.3.2.1.6.2	FEB pre-operations in West Hall	0	0	0	0	0	0	0	0	0	0
3.3.2.1.6.3	System Crate pre-operations	0	0	12	33	0	0	0	0	0	0
3.3.2.1.6.4	System crate Pre-operations	0	0	23	0	0	0	0	0	0	0
3.3.2.2	Operations	0	159	427	632	484	459	498	464	459	459
3.3.2.2.1	Motherboard System	0	0	0	0	0	0	0	0	0	0
3.3.2.2.2	Preamp/Calibration	0	0	0	0	21	21	21	21	21	21
3.3.2.2.2.1	Preamp Operations	0	0	0	0	21	21	21	21	21	21
3.3.2.2.2.2	Calibration Operations	0	0	0	0	0	0	0	0	0	0
3.3.2.2.3	System Crate	0	159	409	533	415	395	395	395	395	395
3.3.2.2.3.1	Readout electronics	0	0	138	263	129	129	129	129	129	129
3.3.2.2.3.2	Crate operations Software	0	71	58	58	146	125	125	125	125	125
3.3.2.2.3.3	BNL operations Physicist	0	0	0	0	0	0	0	0	0	0
3.3.2.2.3.5	LAr Data Base Operation	0	89	174	174	126	126	126	126	126	126
3.3.2.2.3.6	SMU Data Base Operation	0	0	39	39	15	15	15	15	15	15
3.3.2.2.4	Front End Board	0	0	0	0	0	0	0	0	0	0
3.3.2.2.4.1	FEB operations Software	0	0	0	0	0	0	0	0	0	0
3.3.2.2.5	Level 1 Trigger	0	0	18	93	42	37	76	42	37	37
3.3.2.2.5.2	Pitts operations support and	0	0	9	84	33	29	68	33	29	29
3.3.2.2.5.3	Pitts operations support	0	0	9	9	9	9	9	9	9	9
3.3.2.2.6	ROD System	0	0	0	6	6	6	6	6	6	6
3.3.2.2.6.1	ROD operations Software	0	0	0	6	6	6	6	6	6	6

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3.3.2.3	Maintenance	0	0	27	174	447	459	479	460	456	456
3.3.2.3.1	Motherboard System	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2	Preamps/Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2.1	Preamps/Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2.2	Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.3	System Crate	0	0	27	118	414	431	427	427	427	427
3.3.2.3.3.1	Power Supply maintenance, BNL	0	0	0	91	206	206	206	206	206	206
3.3.2.3.3.2	Optical Links and system cables	0	0	0	0	79	79	75	75	75	75
3.3.2.3.3.3	Crates maintenance	0	0	0	0	41	41	41	41	41	41
3.3.2.3.3.4	DCS and monitoring	0	0	0	0	60	60	60	60	60	60
3.3.2.3.3.5	Electronics facility maintenance	0	0	27	27	27	44	44	44	44	44
3.3.2.3.4	Front End Board	0	0	0	0	0	0	0	0	0	0
3.3.2.3.4.1	Front End Readout Electronic	0	0	0	0	0	0	0	0	0	0
3.3.2.3.5	Level 1 Trigger	0	0	0	56	33	29	52	33	29	29
3.3.2.3.5.1	Level 1 trigger electronic	0	0	0	56	33	29	52	33	29	29
3.3.2.3.6	ROD System	0	0	0	0	0	0	0	0	0	0
3.3.2.3.6.2	ROD maintenance Stony Brook	0	0	0	0	0	0	0	0	0	0
3.3.3	Beam Test	0	449	114	0	42	42	42	42	42	42
3.3.3.1	FCAL Hadronic Tail Measurement	0	119	47	0	0	0	0	0	0	0
3.3.3.2	Test Beam - optical links	0	170	0	0	0	0	0	0	0	0
3.3.3.3	Front-end readout commissioning	0	50	14	0	0	0	0	0	0	0
3.3.3.4	Beam test equipment modification	0	109	54	0	42	42	42	42	42	42
3.3.3.4.1	Crate	0	0	18	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.3.3.4.2	Cooling	0	23	23	0	0	0	0	0	0	0
3.3.3.4.3	Power Supplies	0	0	13	0	0	0	0	0	0	0
3.3.3.4.4	Feedthrough	0	44	0	0	0	0	0	0	0	0
3.3.3.4.5	Mother board system	0	43	0	0	0	0	0	0	0	0
3.3.3.4.6	Beam test equipment support	0	0	0	0	42	42	42	42	42	42
3.3.4	CERN living expenses	0	0	102	102	102	102	102	102	102	102
3.3.4.1	USATLAS operation/maintenance	0	0	102	102	102	102	102	102	102	102
3.3.5	CERN common costs	0	22	27	94	150	262	276	273	273	209
3.3.5.1	CERN common costs	0	22	27	94	150	262	276	273	273	209
3.4	Tile Calorimeter	0	363	526	881	1075	717	716	715	784	715
3.4.1	TileCal - Specific Costs	0	228	351	663	923	555	555	555	623	555
3.4.1.1	Pre-Operations	0	228	351	650	220	0	0	0	0	0
3.4.1.1.1	Mechanical Support	0	131	113	134	49	0	0	0	0	0
3.4.1.1.1.1	Module Validation	0	90	33	33	0	0	0	0	0	0
3.4.1.1.1.1.1	ANL	0	62	33	33	0	0	0	0	0	0
3.4.1.1.1.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.1.3	U. Illinois	0	27	0	0	0	0	0	0	0	0
3.4.1.1.1.1.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4	Integration	0	41	79	100	49	0	0	0	0	0
3.4.1.1.1.4.1	ANL	0	41	79	100	49	0	0	0	0	0
3.4.1.1.1.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.5	UTA	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.1.2	Electrical Support	0	97	191	411	66	0	0	0	0	0
3.4.1.1.2.3	Validation, Repairs, and	0	69	63	141	0	0	0	0	0	0
3.4.1.1.2.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.3.2	U.Chicago	0	69	50	84	0	0	0	0	0	0
3.4.1.1.2.3.3	U. Illinois	0	0	13	42	0	0	0	0	0	0
3.4.1.1.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.3.5	UTA	0	0	0	15	0	0	0	0	0	0
3.4.1.1.2.4	Integration	0	12	40	109	0	0	0	0	0	0
3.4.1.1.2.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.2	U.Chicago	0	12	40	109	0	0	0	0	0	0
3.4.1.1.2.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5	Pre-operational testing and	0	16	87	161	66	0	0	0	0	0
3.4.1.1.2.5.1	ANL	0	0	66	105	28	0	0	0	0	0
3.4.1.1.2.5.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5.3	U. Illinois	0	0	0	30	21	0	0	0	0	0
3.4.1.1.2.5.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5.5	UTA	0	16	22	25	17	0	0	0	0	0
3.4.1.1.3	Software Support	0	0	48	105	105	0	0	0	0	0
3.4.1.1.3.1	ANL	0	0	48	105	105	0	0	0	0	0
3.4.1.1.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4	Physicist Support	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.1.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2	Operations (Beam-on)	0	0	0	0	488	400	400	400	400	400
3.4.1.2.1	Mechanical Support	0	0	0	0	127	66	66	66	66	66
3.4.1.2.1.1	ANL	0	0	0	0	127	66	66	66	66	66
3.4.1.2.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2	Electrical Support	0	0	0	0	166	139	139	139	139	139
3.4.1.2.2.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.2	U.Chicago	0	0	0	0	166	139	139	139	139	139
3.4.1.2.2.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3	Software Support	0	0	0	0	196	196	196	196	196	196
3.4.1.2.3.1	ANL	0	0	0	0	114	114	114	114	114	114
3.4.1.2.3.2	U.Chicago	0	0	0	0	82	82	82	82	82	82
3.4.1.2.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4	Physicist Support	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.5	UTA	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.3	Maintenance (Beam-off)	0	0	0	13	215	154	154	154	223	154
3.4.1.3.1	Mechanical Support	0	0	0	4	115	89	89	89	89	89
3.4.1.3.1.1	ANL	0	0	0	0	104	78	78	78	78	78
3.4.1.3.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.3.1.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.1.4	MSU	0	0	0	4	11	11	11	11	11	11
3.4.1.3.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2	Electrical Support	0	0	0	0	91	56	56	56	125	56
3.4.1.3.2.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2.2	U.Chicago	0	0	0	0	58	31	31	31	100	31
3.4.1.3.2.3	U. Illinois	0	0	0	0	18	14	14	14	14	14
3.4.1.3.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2.5	UTA	0	0	0	0	15	12	12	12	12	12
3.4.1.3.3	Software Support	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4	Physicist Support	0	0	0	9	9	9	9	9	9	9
3.4.1.3.4.1	ANL	0	0	0	9	9	9	9	9	9	9
3.4.1.3.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.2	Calibration & Monitoring	0	115	154	200	29	29	29	29	29	29
3.4.2.1	Pre-Operations	0	115	154	200	0	0	0	0	0	0

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3.4.2.1.1	ANL	0	77	82	98	0	0	0	0	0	0
3.4.2.1.2	U.Chicago	0	22	39	39	0	0	0	0	0	0
3.4.2.1.3	U. Illinois	0	0	0	18	0	0	0	0	0	0
3.4.2.1.4	MSU	0	15	15	29	0	0	0	0	0	0
3.4.2.1.5	UTA	0	0	18	16	0	0	0	0	0	0
3.4.2.2	Operations (Beam-on)	0	0	0	0	29	29	29	29	29	29
3.4.2.2.1	ANL	0	0	0	0	29	29	29	29	29	29
3.4.2.2.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.2.2.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.2.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.2.2.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.2.3	Maintenance (Beam-off)	0	0	0	0	0	0	0	0	0	0
3.4.2.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.2.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.2.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.2.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.3	Tilecal System Common Costs	0	21	21	19	123	133	132	131	131	131
3.4.3.1	Operations	0	21	21	19	123	133	132	131	131	131
3.4.3.1.1	ANL	0	21	21	19	123	133	132	131	131	131
3.5	Muon - Endcap	0	1058	1620	1473	813	895	862	780	780	780
3.5.1	MDT Pre-Operations, Operations and	0	702	1034	943	397	190	190	190	190	190
3.5.1.1	MDT Pre-operations	0	702	1034	943	304	0	0	0	0	0
3.5.1.1.1	Setup of MDT Staging and Test	0	146	0	0	0	0	0	0	0	0
3.5.1.1.1.1	Engineering Design of MDT Test	0	37	0	0	0	0	0	0	0	0

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3.5.1.1.1.1.1	Michigan	0	37	0	0	0	0	0	0	0	0
3.5.1.1.1.2	Commission MDT Test Station	0	109	0	0	0	0	0	0	0	0
3.5.1.1.1.2.1	Michigan	0	109	0	0	0	0	0	0	0	0
3.5.1.1.2	Pre-Operations of MDT	0	397	259	0	0	0	0	0	0	0
3.5.1.1.2.1	Verify MDT Mechanical Integrity -	0	195	92	0	0	0	0	0	0	0
3.5.1.1.2.1.1	Michigan - Phase I	0	99	40	0	0	0	0	0	0	0
3.5.1.1.2.1.2	U. Washington/Seattle - Phase I	0	96	52	0	0	0	0	0	0	0
3.5.1.1.2.2	Verify MDT Chamber Electronics	0	202	166	0	0	0	0	0	0	0
3.5.1.1.2.2.1	Michigan - Phase I	0	157	136	0	0	0	0	0	0	0
3.5.1.1.2.2.2	U. Washington/Seattle - Phase I	0	45	30	0	0	0	0	0	0	0
3.5.1.1.3	Pre-Operations of MDT	0	159	776	407	0	0	0	0	0	0
3.5.1.1.3.1	Verify MDT Mechanical Integrity -	0	0	387	186	0	0	0	0	0	0
3.5.1.1.3.1.1	Michigan - Phase II	0	0	159	36	0	0	0	0	0	0
3.5.1.1.3.1.2	U. Washington/Seattle - Phase II	0	0	52	105	0	0	0	0	0	0
3.5.1.1.3.1.3	Boston University - Phase II	0	0	129	0	0	0	0	0	0	0
3.5.1.1.3.1.4	Harvard - Phase II	0	0	47	45	0	0	0	0	0	0
3.5.1.1.3.2	Verify MDT Chamber Electronics	0	0	389	221	0	0	0	0	0	0
3.5.1.1.3.2.1	Michigan - Phase II	0	0	276	210	0	0	0	0	0	0
3.5.1.1.3.2.2	U. Washington/Seattle - Phase II	0	0	34	12	0	0	0	0	0	0
3.5.1.1.3.2.3	Boston - Phase II	0	0	0	0	0	0	0	0	0	0
3.5.1.1.3.2.4	Harvard - Phase II	0	0	79	0	0	0	0	0	0	0
3.5.1.1.3.3	BW Single Sector Test	0	159	0	0	0	0	0	0	0	0
3.5.1.1.3.3.1	Brandeis - BW Single Sector Test	0	65	0	0	0	0	0	0	0	0
3.5.1.1.3.3.2	Michigan - BW Single Sector Test	0	37	0	0	0	0	0	0	0	0
3.5.1.1.3.3.3	U. Washington/Seattle - BW	0	57	0	0	0	0	0	0	0	0

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3.5.1.1.4	Pre-Operations of MDT	0	0	0	536	304	0	0	0	0	0
3.5.1.1.4.1	Verify MDT Mechanical Integrity -	0	0	0	250	158	0	0	0	0	0
3.5.1.1.4.1.1	Brandeis University - Phase III	0	0	0	136	44	0	0	0	0	0
3.5.1.1.4.1.2	Boston University - Phase III	0	0	0	114	114	0	0	0	0	0
3.5.1.1.4.1.3	Harvard University - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.1.4	Michigan - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.1.5	U. Washington - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.2	Verify MDT Chamber Electronics	0	0	0	286	147	0	0	0	0	0
3.5.1.1.4.2.1	Harvard University - Phase III	0	0	0	211	72	0	0	0	0	0
3.5.1.1.4.2.2	Michigan - Phase III	0	0	0	75	75	0	0	0	0	0
3.5.1.2	MDT Operations (Beam On)	0	0	0	0	92	116	116	116	116	116
3.5.1.2.1	MDT Mechanical Operations	0	0	0	0	40	52	52	52	52	52
3.5.1.2.1.1	Brandeis University	0	0	0	0	40	52	52	52	52	52
3.5.1.2.2	MDT Electronics Operations	0	0	0	0	52	64	64	64	64	64
3.5.1.2.2.1	Michigan	0	0	0	0	52	64	64	64	64	64
3.5.1.3	MDT Maintenance (Beam Off)	0	0	0	0	0	67	67	67	67	67
3.5.1.3.1	MDT Mechanical Maintenance	0	0	0	0	0	28	28	28	28	28
3.5.1.3.1.1	Brandeis University - Beam Off	0	0	0	0	0	28	28	28	28	28
3.5.1.3.2	MDT Electronics Maintenance	0	0	0	0	0	39	39	39	39	39
3.5.1.3.2.1	Michigan - Beam Off	0	0	0	0	0	39	39	39	39	39
3.5.1.4	MDT Spares - Mechanical and	0	0	0	0	0	7	7	7	7	7
3.5.1.4.1	MDT Mechanical Spares	0	0	0	0	0	3	3	3	3	3
3.5.1.4.1.1	Harvard University	0	0	0	0	0	3	3	3	3	3

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3.5.1.4.2	MDT Electronics Spares	0	0	0	0	0	4	4	4	4	4
3.5.1.4.2.1	Harvard University	0	0	0	0	0	4	4	4	4	4
3.5.2	CSC Pre-Operations, Operations and	0	58	330	172	160	126	82	82	82	82
3.5.2.1	CSC Pre-operations	0	58	330	165	78	0	0	0	0	0
3.5.2.1.1	Setup of CSC Staging and Test	0	58	44	0	0	0	0	0	0	0
3.5.2.1.1.1	Engineering Design of CSC Test	0	7	7	0	0	0	0	0	0	0
3.5.2.1.1.1.1	BNL	0	7	0	0	0	0	0	0	0	0
3.5.2.1.1.1.2	UCI	0	0	7	0	0	0	0	0	0	0
3.5.2.1.1.2	Commission CSC Test Station	0	50	36	0	0	0	0	0	0	0
3.5.2.1.1.2.1	BNL	0	50	18	0	0	0	0	0	0	0
3.5.2.1.1.2.2	UCI	0	0	18	0	0	0	0	0	0	0
3.5.2.1.2	Pre-Operations of CSC	0	0	174	0	0	0	0	0	0	0
3.5.2.1.2.1	Verify CSC Mechanical Integrity -	0	0	56	0	0	0	0	0	0	0
3.5.2.1.2.1.1	BNL - Phase I	0	0	56	0	0	0	0	0	0	0
3.5.2.1.2.1.2	UCI - Phase I	0	0	0	0	0	0	0	0	0	0
3.5.2.1.2.2	Verify CSC Chamber Electronics	0	0	118	0	0	0	0	0	0	0
3.5.2.1.2.2.1	BNL - Phase I	0	0	89	0	0	0	0	0	0	0
3.5.2.1.2.2.2	UCI - Phase I	0	0	29	0	0	0	0	0	0	0
3.5.2.1.3	Pre-Operations of CSC	0	0	112	109	0	0	0	0	0	0
3.5.2.1.3.1	Verify CSC Mechanical Integrity -	0	0	13	18	0	0	0	0	0	0
3.5.2.1.3.1.1	BNL - Phase II	0	0	13	18	0	0	0	0	0	0
3.5.2.1.3.1.2	UCI - Phase II	0	0	0	0	0	0	0	0	0	0
3.5.2.1.3.2	Verify CSC Chamber Electronics	0	0	100	91	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.2.1.3.2.1	BNL - Phase II	0	0	63	28	0	0	0	0	0	0
3.5.2.1.3.2.2	UCI - Phase II	0	0	36	63	0	0	0	0	0	0
3.5.2.1.4	Pre-Operations of CSC	0	0	0	56	78	0	0	0	0	0
3.5.2.1.4.1	Verify CSC Mechanical Integrity -	0	0	0	18	11	0	0	0	0	0
3.5.2.1.4.1.1	BNL - Phase III	0	0	0	18	11	0	0	0	0	0
3.5.2.1.4.1.2	UCI - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.2.1.4.2	Verify CSC Chamber Electronics	0	0	0	38	67	0	0	0	0	0
3.5.2.1.4.2.1	BNL - Phase III	0	0	0	38	45	0	0	0	0	0
3.5.2.1.4.2.2	UCI - Phase III	0	0	0	0	22	0	0	0	0	0
3.5.2.2	CSC Operations (Beam On)	0	0	0	0	75	38	38	38	38	38
3.5.2.2.1	CSC Mechanical Operations	0	0	0	0	14	5	5	5	5	5
3.5.2.2.1.1	BNL - Beam On	0	0	0	0	14	5	5	5	5	5
3.5.2.2.1.2	UCI - Beam On	0	0	0	0	0	0	0	0	0	0
3.5.2.2.2	CSC Electronics Operations	0	0	0	0	61	34	34	34	34	34
3.5.2.2.2.1	BNL - Beam On	0	0	0	0	29	24	24	24	24	24
3.5.2.2.2.2	UCI - Beam On	0	0	0	0	32	9	9	9	9	9
3.5.2.3	CSC Maintenance (Beam Off)	0	0	0	0	0	69	24	24	24	24
3.5.2.3.1	CSC Mechanical Maintenance	0	0	0	0	0	15	4	4	4	4
3.5.2.3.1.1	BNL - Beam Off	0	0	0	0	0	15	4	4	4	4
3.5.2.3.1.2	UCI - Beam Off	0	0	0	0	0	0	0	0	0	0
3.5.2.3.2	CSC Electronics Maintenance	0	0	0	0	0	54	20	20	20	20
3.5.2.3.2.1	BNL - Beam Off	0	0	0	0	0	22	11	11	11	11
3.5.2.3.2.2	UCI - Beam Off	0	0	0	0	0	32	9	9	9	9
3.5.2.4	CSC Spares - Mechanical and	0	0	0	7	7	19	19	19	19	19

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.2.4.1	CSC Mechanical Spares	0	0	0	3	3	8	8	8	8	8
3.5.2.4.1.1	BNL	0	0	0	0	0	5	5	5	5	5
3.5.2.4.2	CSC Electronics Spares	0	0	0	4	4	11	11	11	11	11
3.5.2.4.2.1	BNL	0	0	0	0	0	5	5	5	5	5
3.5.2.4.2.2	UCI	0	0	0	0	0	3	3	3	3	3
3.5.3	Alignment System Pre-Operations,	0	8	161	228	76	86	86	86	86	86
3.5.3.1	Alignment System Pre-operations	0	8	161	228	76	0	0	0	0	0
3.5.3.1.1	Pre-Ops Staging Area for	0	8	23	0	0	0	0	0	0	0
3.5.3.1.1.1	Eng. Design for Alignment	0	8	5	0	0	0	0	0	0	0
3.5.3.1.1.1.1	Brandeis	0	8	5	0	0	0	0	0	0	0
3.5.3.1.1.2	Commission Alignment Stage &	0	0	18	0	0	0	0	0	0	0
3.5.3.1.1.2.1	Brandeis	0	0	18	0	0	0	0	0	0	0
3.5.3.1.2	Pre-operations of Alignment	0	0	62	0	0	0	0	0	0	0
3.5.3.1.2.1	Brandeis - Phase I	0	0	62	0	0	0	0	0	0	0
3.5.3.1.3	Pre-operations of Alignment	0	0	77	68	0	0	0	0	0	0
3.5.3.1.3.1	Brandeis - Phase II	0	0	77	68	0	0	0	0	0	0
3.5.3.1.4	Pre-operations of Alignment -	0	0	0	160	76	0	0	0	0	0
3.5.3.1.4.1	Brandeis - Phase III	0	0	0	160	76	0	0	0	0	0
3.5.3.2	Alignment System Operation	0	0	0	0	0	19	19	19	19	19
3.5.3.2.1	Brandeis	0	0	0	0	0	19	19	19	19	19
3.5.3.3	Alignment System Maintenance	0	0	0	0	0	67	67	67	67	67
3.5.3.3.1	Alignment Bars	0	0	0	0	0	17	17	17	17	17

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.3.3.1.1	Brandeis	0	0	0	0	0	17	17	17	17	17
3.5.3.3.2	Proximity Monitors	0	0	0	0	0	16	16	16	16	16
3.5.3.3.2.1	Brandeis	0	0	0	0	0	16	16	16	16	16
3.5.3.3.3	Multi-Point System (BCAM)	0	0	0	0	0	20	20	20	20	20
3.5.3.3.3.1	Brandeis	0	0	0	0	0	20	20	20	20	20
3.5.3.3.4	In-Plane System	0	0	0	0	0	16	16	16	16	16
3.5.3.3.4.1	Brandeis	0	0	0	0	0	16	16	16	16	16
3.5.4	Muon Endcap Common Costs	0	91	95	130	181	367	378	295	295	295
3.5.4.1	Engineering Coordination of	0	0	0	0	0	0	0	0	0	0
3.5.4.1.1	Engineering Coordination - BNL	0	0	0	0	0	0	0	0	0	0
3.5.4.2	Muon Endcap Common Cost	0	91	95	130	181	367	378	295	295	295
3.5.4.2.1	MDT Operations Common	0	48	48	66	91	60	66	95	95	95
3.5.4.2.2	CSC-related Common Items-BNL	0	0	5	7	9	31	32	22	22	22
3.5.4.2.3	M&O(B) Common Cost - MIT	0	43	42	58	80	275	280	179	179	179
3.5.4.2.4	C&I(B) Common Cost - MIT	0	0	0	0	0	0	0	0	0	0
3.5.5	Monitoring & Calibration	0	200	0	0	0	126	126	126	126	126
3.5.5.1	Monitoring and Calibration Beam	0	0	0	0	0	126	126	126	126	126
3.5.5.1.1	MDT M&C System	0	0	0	0	0	67	67	67	67	67
3.5.5.1.1.1	MDT Monitoring and Calibration -	0	0	0	0	0	67	67	67	67	67
3.5.5.1.2	CSC M&C System	0	0	0	0	0	21	21	21	21	21
3.5.5.1.2.1	CSC M&C System Operation -	0	0	0	0	0	21	21	21	21	21
3.5.5.1.3	Alignment M&C System	0	0	0	0	0	20	20	20	20	20
3.5.5.1.3.1	Alignment M&C System -	0	0	0	0	0	20	20	20	20	20

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.5.1.4	Environmental Sensors M&C	0	0	0	0	0	18	18	18	18	18
3.5.5.1.4.1	Environmental Sensor operation	0	0	0	0	0	18	18	18	18	18
3.5.5.2	Muon Test Beams	0	200	0	0	0	0	0	0	0	0
3.5.5.2.1	Muon Test Beam Support -	0	76	0	0	0	0	0	0	0	0
3.5.5.2.2	Muon Test Beam Support - BNL	0	30	0	0	0	0	0	0	0	0
3.5.5.2.3	Muon Test Beam Support -	0	26	0	0	0	0	0	0	0	0
3.5.5.2.4	Muon Test Beam UCI	0	17	0	0	0	0	0	0	0	0
3.5.5.2.5	Muon Test Beam - Tufts	0	50	0	0	0	0	0	0	0	0
3.6	Trigger/DAQ	0	121	111	1007	1192	727	543	543	543	543
3.6.1	Pre Operations	0	121	89	196	0	0	0	0	0	0
3.6.1.1	Supervisor Rol Builder	0	0	0	0	0	0	0	0	0	0
3.6.1.2	Communications and Travel	0	0	0	0	0	0	0	0	0	0
3.6.1.2.1	Communications and Travel	0	0	0	0	0	0	0	0	0	0
3.6.1.2.2	Communications and Travel	0	0	0	0	0	0	0	0	0	0
3.6.1.3	Programming Support	0	109	78	196	0	0	0	0	0	0
3.6.1.3.1	Programming Support	0	73	63	136	0	0	0	0	0	0
3.6.1.3.2	Programming Support	0	36	15	60	0	0	0	0	0	0
3.6.1.4	Equipment	0	13	12	0	0	0	0	0	0	0
3.6.1.4.1	Equipment ANL	0	6	6	0	0	0	0	0	0	0
3.6.1.4.2	Equipment MSU	0	7	6	0	0	0	0	0	0	0
3.6.2	Operations	0	0	21	811	1192	727	543	543	543	543
3.6.2.1	Supervisor Rol Builder	0	0	0	216	260	216	172	172	172	172
3.6.2.1.1	Supervisor Rol Builder	0	0	0	136	180	136	92	92	92	92
3.6.2.1.2	Supervisor Rol Builder	0	0	0	80	80	80	80	80	80	80

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.6.2.2	Communications and Travel	0	0	0	50	120	50	50	50	50	50
3.6.2.2.1	Communications and Travel	0	0	0	13	31	13	13	13	13	13
3.6.2.2.2	Communications and Travel	0	0	0	13	30	13	13	13	13	13
3.6.2.2.3	Communications and Travel	0	0	0	13	30	13	13	13	13	13
3.6.2.2.4	Communications and Travel	0	0	0	12	29	12	12	12	12	12
3.6.2.3	Programming Support	0	0	0	524	790	440	300	300	300	300
3.6.2.3.1	Programming Support	0	0	0	158	241	131	88	88	88	88
3.6.2.3.2	Programming Support	0	0	0	119	181	99	66	66	66	66
3.6.2.3.3	Programming Support	0	0	0	83	122	71	51	51	51	51
3.6.2.3.4	Programming Support	0	0	0	165	247	139	96	96	96	96
3.6.2.4	Test facilities	0	0	21	21	21	21	21	21	21	21
3.6.2.4.1	Test Facilities	0	0	10	10	10	10	10	10	10	10
3.6.2.4.2	Test Facilities	0	0	11	11	11	11	11	11	11	11
3.6.3	CERN Common Costs	0	0	0	0	0	0	0	0	0	0
3.7	Common Funds	0	690	835	1145	1174	1341	1529	1668	1668	1668
3.7.1	Common Funds (BNL)	0	274	835	1145	1174	1341	1529	1668	1668	1668
3.7.2	Common Funds (Nevis)	0	416	0	0	0	0	0	0	0	0
3.8	Outreach	0	28	34	43	45	50	50	50	50	50
3.9	Program Management	0	221	955	959	959	959	959	959	959	959
3.9.1	Program Management	0	0	872	877	877	877	877	877	877	877
3.9.2	Program Management	0	221	82	82	82	82	82	82	82	82
3.10	Technical Coordination	0	0	850	850	850	850	850	850	850	850
3.10.1	ATLAS Access	0	0	298	298	298	216	216	216	216	216
3.10.1.1	Access Equipment	0	0	216	216	216	216	216	216	216	216
3.10.1.2	Access and Interface Beam and	0	0	82	82	82	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.10.2	Maintenance of Movement System	0	0	144	144	144	144	144	144	144	144
3.10.2.1	Movement System Control	0	0	144	144	144	144	144	144	144	144
3.10.3	Configuration Control Envelope	0	0	319	319	319	319	319	319	319	319
3.10.3.1	Configuration Control	0	0	213	213	213	213	213	213	213	213
3.10.3.2	Configuration Control @ CERN	0	0	85	85	85	85	85	85	85	85
3.10.3.3	EC Muons Configuration Control	0	0	21	21	21	21	21	21	21	21
3.10.4	Installation and Maintenance Data	0	0	90	90	90	171	171	171	171	171
3.10.4.1	Installation Data Base	0	0	0	0	0	0	0	0	0	0
3.10.4.2	Installation Data Base @ CERN	0	0	90	90	90	171	171	171	171	171
3.10.5	TC Project Office	0	0	0	0	0	0	0	0	0	0